

REMARKS

Applicant has carefully studied the outstanding Official Action. The present amendment is intended to be fully responsive to all points of rejection and is believed to place the application in condition for allowance. Favorable 5 reconsideration and allowance of the present application are hereby respectfully requested.

With respect to the Information Disclosure Statement, Applicant believes that providing a statement of relevance by the Applicant for each of the cited references may affect the objective consideration of the application and also, 10 since the requirement for a concise statement of the relevance of each item of information listed in an information disclosure statement has been eliminated in most cases, provision of a statement of relevance for each of the references cited in the Information Disclosure Statement in the present application is deemed to be unnecessary.

15 Claims 1 – 22 were examined. Claims 1 – 22 have been canceled and new claims 23 – 46 have been added. Thus, claims 23 – 46 are now pending in the application.

Claims 1 – 9 and 13 – 15 stand rejected under 35 USC 102(a) as being anticipated by US Patent 6,288,808 to Lee et al (“Lee”).

20 Claims 10 – 12 and 16 – 22 stand rejected under 35 USC 103(a) as being unpatentable over Lee.

Lee describes an optical asynchronous transfer mode ATM switch for recovering the limitation of processing capacity and performing large capacity of switching.

25 Claims 1 – 22 have been canceled without prejudice.

New claims 23 – 46 have been added.

30 New claim 23 includes recitations from original claims 1 and 2 and additional recitations. Claim 23 is supported similarly to claims 1 and 2 and further by Fig. 4 and by the following passages in the specification: the first full paragraph on page 11; the paragraph bridging pages 32 and 33; and the third and fourth paragraphs on page 37.

Claim 23 recites, *inter alia*, a combination comprising grouping the NW wavelengths into KG groups of wavelengths according to the different attributes of the characteristic based on delay sensitivity so that each of the KG groups of wavelengths is allocated to optical packets having a common delay 5 sensitivity level which is different from a delay sensitivity level of other optical packets, and switching each one inputted optical packet over a wavelength having an available transmission resource selected from among wavelengths in one of the KG groups of wavelengths that is matched to the one inputted optical packet by correspondence of a delay sensitivity level.

10 In rejecting original claim 2 the Examiner refers to Fig. 5 in Lee and to col. 4, lines 26 – 60 in Lee regarding a characteristic based on delay sensitivity. However, it is respectfully submitted that Lee does not refer to delay sensitivity of optical packets at all and does not distinguish among different attributes of a characteristic based on delay sensitivity of inputted optical packets. Fig. 5 in Lee 15 only shows a timing chart of the WDM-to-TDM conversion module as specifically mentioned in col. 4, lines 28 – 31 in Lee. In col. 4, lines 26 – 60 Lee mentions that collision may occur between cells while being inputted to the first router 25 and that in order to prevent the occurrence of this case, respective cells are compressed to T/n by compressors 39 to allow all the n channels 33 to be time division multiplexed 20 into one cell period T 37. Lee further mentions that the respective compressed cells pass through delay lines 40 having a difference of T/n 41 delay length and coupled by a $n \times 1$ coupler 42 (see col. 4, lines 49 – 56 in Lee).

25 The collision mentioned in Lee is due to cells arriving at the same time and such collision has nothing to do with delay sensitivity because cells may arrive at the same time regardless of whether the cells are sensitive or insensitive to delays. The compression and the delays of T/n in Lee are only used to overcome the collision and to allow proper time division multiplexing (TDM) and are not related in any form to delay sensitivity of optical packets. Specifically, after the cells are compressed, the delays of T/n are used to sequentially place the compressed cells in 30 sub-periods of a cell period to enable an entire cell period to include a plurality of compressed cells as shown in Fig. 5 of Lee. Such placement in sub-periods of a cell

period is performed for all the compressed cells as part of a normal TDM technique which has nothing to do with delay sensitivity of the cells, and indeed Lee does not refer to delay sensitivity of cells and does not distinguish among cells having different attributes of a characteristic based on delay sensitivity.

5 In fact, even if, for the sake of argument only, the system of Lee would have used delay sensitive packets, such as packets carrying voice information, and delay insensitive packets, such as packets carrying data, then both the delay sensitive packets and the delay insensitive packets would have been delayed by T/n or by a multiple of T/n in order to enable proper TDM, and Lee would not
10 distinguish among the delay sensitive packets and the delay insensitive packets.

Accordingly, Lee cannot show or suggest the combination recited in claim 23.

Claim 23 is therefore deemed allowable.

15 Claim 24 is supported, *inter alia*, by the following passages in the specification: the first full paragraph on page 11; and the third paragraph on page 37.

Claim 24 depends from claim 23 and recites additional patentable subject matter.

20 Also as regards claim 24, it is respectfully submitted that Lee does not show or suggest allocating more wavelengths to delay sensitive optical packets than to delay insensitive optical packets.

Claim 24 is therefore deemed allowable.

Claims 25 and 26 are supported, *inter alia*, by the third paragraph on page 32 of the specification.

25 Claims 25 and 26 depend directly or indirectly from claim 23 and recite additional patentable subject matter.

Claims 25 and 26 are therefore deemed allowable.

Claim 27 is supported, *inter alia*, by Fig. 4 and by the first and second full paragraphs on page 42 of the specification.

30 Claim 27 depends from claim 23 and recites additional patentable subject matter.

Also as regards claim 27, it is respectfully submitted that Lee does not distinguish among optical packets having different attributes of a characteristic based on optical packet bit-rate range.

Claim 27 is therefore deemed allowable.

5 Claim 28 is supported similarly to claim 27.

Claim 28 depends from claim 23 and recites additional patentable subject matter.

Also as regards claim 28, it is respectfully submitted that Lee does not distinguish among optical packets having different attributes of a characteristic 10 based on optical packet service level.

Claim 28 is therefore deemed allowable.

Claim 29 includes recitations from original claims 1 and 4 and additional recitations. Claim 29 is supported similarly to claims 1 and 4 and further by the following passages in the specification: the second full paragraph on page 11; 15 the third paragraph on page 17; the second full paragraph on page 33; and from the paragraph bridging pages 38 and 39 through the second full paragraph on page 39.

Claim 29 recites, *inter alia*, a combination comprising grouping the NW wavelengths into KG groups of wavelengths according to the different attributes of the characteristic based on optical packet carrier wavelength band so 20 that each of the KG groups of wavelengths is allocated to optical packets that are provided at a common wavelength band which is different from a wavelength band of other optical packets, where the common wavelength band comprises a plurality of separate optical channels, and switching each one inputted optical packet over a wavelength having an available transmission resource selected from among 25 wavelengths in one of the KG groups of wavelengths that is matched to the one inputted optical packet by correspondence of a wavelength band.

In rejecting original claim 4 the Examiner refers to Figs. 4 and 5 in Lee and to col. 4, lines 26 – 60 in Lee regarding a characteristic based on optical packet carrier wavelength band, and takes the position that each wavelength from 30 the plurality of wavelengths inherently indicates a wavelength band, the inherent spectral width of the wavelength.

It is respectfully submitted that claim 29 refers to a wavelength band and not to a wavelength and its spectral width. Claim 29 also specifically recites that the common wavelength band comprises a plurality of separate optical channels. As is well known in the art, a wavelength band includes a plurality of separate optical 5 channels and each optical channel includes the inherent spectral width of the wavelength of the optical channel. A wavelength band is thus clearly distinguished from a single wavelength and its inherent spectral width.

Referring to Lee, it is respectfully submitted that Lee does not show or suggest the combination recited in claim 29. Specifically, Lee refers only to 10 discrete wavelengths and does not refer to wavelength bands at all. Lee also does not refer to inputted optical packets having different attributes of a characteristic based on optical packet carrier wavelength band. In fact, Lee does not provide any specification of the wavelengths and is silent on matters of wavelength band.

Additionally, Lee converts all optical channels multiplexed by WDM 15 that are provided via a transmission link to a WDM-to-TDM Conversion Module into a primary wavelength (see in Lee, the Abstract, Figs. 3 and 4, col. 3, lines 3 – 24 and col. 4, lines 26 – 60). Therefore, the system of Lee operates in a similar manner on all such optical channels and mixes cells carried on such optical channels and thus the system of Lee cannot distinguish among wavelengths belonging to 20 different wavelength bands and/or among different wavelength bands and also cannot distinguish among inputted optical packets having different attributes of a characteristic based on optical packet carrier wavelength band.

Accordingly, Lee cannot show or suggest the combination recited in 25 claim 29.

Claim 29 is therefore deemed allowable.

Claim 30 is supported, inter alia, by the third full paragraph on page 34 of the specification.

Claim 30 depends from claim 29 and recites additional patentable 30 subject matter.

Also as regards claim 30, it is respectfully submitted that Lee does not show or suggest the common wavelength band which comprises a wavelength band

of an order of magnitude of tens nanometers (nm) around one of the following wavelengths: 780nm; 980nm; 1310nm; 1480nm; 1510nm; 1550nm; and 1620nm.

Claim 30 is therefore deemed allowable.

Claim 31 is supported, inter alia, by the second full paragraph on page 5 33 of the specification.

Claim 31 depends from claim 29 and recites additional patentable subject matter.

Also as regards claim 31, it is respectfully submitted that Lee does not show or suggest the common wavelength band which comprises one of the 10 following wavelength bands: 1488 - 1518 nm (the S-Band); 1526 - 1563 nm (the C-Band); and 1569 - 1613 nm (the L-Band).

Claim 31 is therefore deemed allowable.

Claim 32 is supported, inter alia, by the second full paragraph on page 39 of the specification.

Claim 32 depends from claim 29 and recites additional patentable subject matter.

Also as regards claim 32, it is respectfully submitted that Lee does not show or suggest directing more of the inputted optical packets to a first wavelength band that experiences a first level of interference than to a second wavelength band 20 that experiences a second level of interference which is higher than the first level of interference.

Claim 32 is therefore deemed allowable.

Claims 33 and 34 are supported similarly to claims 25 and 26, respectively.

Claims 33 and 34 depend directly or indirectly from claim 29 and recite additional patentable subject matter.

Claims 33 and 34 are therefore deemed allowable.

Claim 35 includes recitations from original claims 1 and 6 and additional recitations. Claim 35 is supported similarly to claims 1 and 6 and further 30 by the following passages in the specification: the paragraph bridging pages 33 and 34; and from the first full paragraph on page 40 through the first full paragraph on

page 41.

Claim 35 recites, inter alia, a combination comprising grouping the NW wavelengths into KG groups of wavelengths according to the different attributes of the characteristic based on optical packet carrier wavelength priority so 5 that each of the KG groups of wavelengths comprises wavelengths having a common priority which is different from a priority of wavelengths in other groups, where the common priority comprises a priority with respect to at least one of the following: wavelength conversion; susceptibility to interference; and congestion 10 level of carried optical packets, and switching each one inputted optical packet over a wavelength having an available transmission resource selected from among wavelengths in one of the KG groups of wavelengths that is matched to the one inputted optical packet by correspondence of an attribute of the characteristic based 15 on optical packet carrier wavelength priority.

In rejecting original claim 6 the Examiner refers to col. 4, lines 26 - 15 60 in Lee regarding a characteristic based on optical packet carrier wavelength priority, and takes the position that avoiding collision of packets assigned the same destination wavelength indicates equal priority for the packets.

However, as explained above with reference to the discussion of claim 20 23, the avoidance of collision and the placement in sub-periods of a cell period refer only to a normal TDM technique. The avoidance of collision of packets assigned the same destination wavelength has therefore nothing to do with wavelength priority, and particularly has nothing to do with wavelength priority with respect to at least 25 one of the following: wavelength conversion; susceptibility to interference; and congestion level of carried optical packets. In fact, Lee does not refer to matters of wavelength priority at all and particularly does not refer to wavelength priority with respect to at least one of the following: wavelength conversion; susceptibility to interference; and congestion level of carried optical packets.

Additionally, although Lee mentions that the conversion modules convert the optical channels into a primary wavelength for routing their respective 30 channels (Lee, col. 3, lines 5 - 15), Lee does not mention how the primary wavelength is selected and does not provide any specification of the primary

wavelength. Further additionally, since the optical channels are converted into the same primary wavelength, the system of Lee operates in a similar manner on all such optical channels and mixes cells carried on such optical channels and thus the system of Lee cannot distinguish among wavelengths having different priorities and 5 also cannot distinguish among inputted optical packets having different attributes of a characteristic based on optical packet carrier wavelength priority.

For example, since the system of Lee operates in a similar manner on the optical channels, the optical channels (wavelengths) in Lee cannot have any priority with respect to wavelength conversion and also cells carried on such optical 10 channels cannot be distinguished based on priority with respect to wavelength conversion. For the same reason, wavelengths in Lee cannot have any priority with respect to susceptibility to interference or with respect to congestion level of carried optical packets, and also cells carried on such wavelengths cannot be distinguished based on priority with respect to susceptibility to interference or based on priority 15 with respect to congestion level of carried optical packets.

Accordingly, Lee cannot show or suggest the combination recited in claim 35.

Claim 35 is therefore deemed allowable.

Claims 36 and 37 are supported similarly to claims 25 and 26, 20 respectively.

Claims 36 and 37 depend directly or indirectly from claim 35 and recite additional patentable subject matter.

Claims 36 and 37 are therefore deemed allowable.

Claim 38 includes recitations from original claims 1 and 7 and 25 additional recitations. Claim 38 is supported similarly to claims 1 and 7 and further by the following passages in the specification: the first full paragraph on page 34; and the second and third full paragraphs on page 41.

Claim 38 recites, *inter alia*, a combination comprising grouping the NW wavelengths into KG groups of wavelengths according to the different 30 attributes of the characteristic based on optical packet service level so that each of the KG groups of wavelengths is allocated to optical packets provided at a common

service level which is different from a service level of other optical packets, and switching each one inputted optical packet over a wavelength having an available transmission resource selected from among wavelengths in one of the KG groups of wavelengths that is matched to the one inputted optical packet by correspondence of 5 an optical packet service level.

In rejecting original claim 7 the Examiner refers to col. 4, lines 26 - 60 in Lee regarding a characteristic based on optical packet service level, and takes the position that avoiding collision of packets assigned the same destination wavelength indicates equal service level for the packets.

10 However, as explained above with reference to the discussion of claim 23, the avoidance of collision and the placement in sub-periods of a cell period refer only to a normal TDM technique. The avoidance of collision of packets assigned the same destination wavelength has therefore nothing to do with optical packet service levels, and in fact, Lee does not refer to optical packet service levels at all.

15 Additionally, as mentioned above with reference to the discussion of claim 29, Lee converts all optical channels multiplexed by WDM that are provided via a transmission link to a WDM-to-TDM Conversion Module into a primary wavelength (see in Lee, the Abstract, Figs. 3 and 4, col. 3, lines 3 – 24 and col. 4, lines 26 – 60). Therefore, the system of Lee operates in a similar manner on all such 20 optical channels and mixes cells carried on such optical channels and thus the system of Lee cannot distinguish among different service levels and also cannot distinguish among inputted optical packets having different attributes of a characteristic based on optical packet service level.

25 Accordingly, Lee cannot show or suggest the combination recited in claim 38.

Claim 38 is therefore deemed allowable.

Claim 39 is supported, inter alia, by the third full paragraph on page 41 of the specification.

30 Claim 39 depends from claim 38 and recites additional patentable subject matter.

Also as regards claim 39, it is respectfully submitted that Lee does not show or suggest allocating a different number of wavelengths to inputted optical packets provided at different service levels.

Claim 39 is therefore deemed allowable.

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Claim 40 is supported similarly to claim 39.

Claim 40 depends from claim 38 and recites additional patentable subject matter.

Also as regards claim 40, it is respectfully submitted that Lee does not show or suggest allocating wavelengths which provide different transmission conditions to inputted optical packets provided at different service levels.

10 Claim 40 is therefore deemed allowable.

Claims 41 and 42 are supported similarly to claims 25 and 26, respectively.

15 Claims 41 and 42 depend directly or indirectly from claim 38 and recite additional patentable subject matter.

Claims 41 and 42 are therefore deemed allowable.

Claim 43 is apparatus claim corresponding to claim 23 and supported similarly to claim 23.

20 The arguments submitted above with respect to the patentability of claim 23 also apply to claim 43.

Claim 43 is therefore deemed allowable.

Claim 44 is apparatus claim corresponding to claim 29 and supported similarly to claim 29.

25 The arguments submitted above with respect to the patentability of claim 29 also apply to claim 44.

Claim 44 is therefore deemed allowable.

Claim 45 is apparatus claim corresponding to claim 35 and supported similarly to claim 35.

30 The arguments submitted above with respect to the patentability of claim 35 also apply to claim 45.

Claim 45 is therefore deemed allowable.

Claim 46 is apparatus claim corresponding to claim 38 and supported similarly to claim 38.

The arguments submitted above with respect to the patentability of claim 38 also apply to claim 46.

5 Claim 46 is therefore deemed allowable.

Applicant has also carefully studied the other prior art of record including an article titled "The Wavelength Dilation Concept in Lightwave Networks-Implementation and System Considerations" by Sharony et al; Journal of Lightwave Technology; Vol. 11, No. 5/6, May/June 1993; pages 900 – 907
10 (Sharony) which was not applied in rejecting the claims of the present application.

Sharony describes the dilation concept in switching networks which is generalized, and extended to the wavelength dimension, resulting in a new class of dynamic wavelength-routing cross-connects.

15 Applicant finds that Sharony does not affect patentability of the claims of the present application, either taken separately or in combination.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is now in condition for allowance. Favorable reconsideration and allowance of the present application are respectfully requested.

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Respectfully submitted,



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